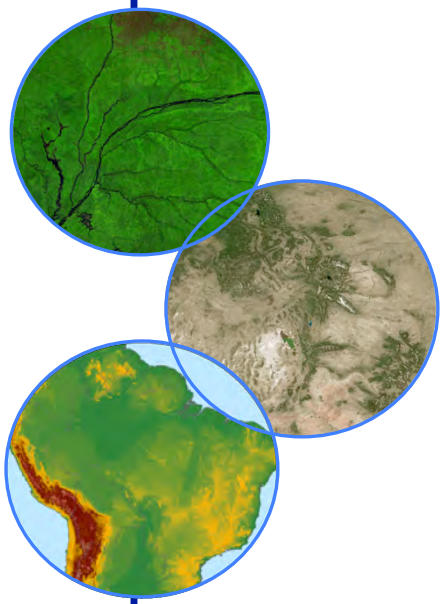
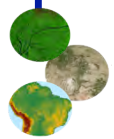
Citing Data Sets in the Literature: ORNL DAAC Practices



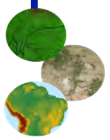
Robert Cook, Suresh SanthanaVannan, and Daine Wright
Environmental Sciences Division
Oak Ridge National Laboratory
Oak Ridge, TN

MODIS Science Team Meeting
Columbia, MD
April 30, 2014

Presentation Outline



- Metrics of Impact
- Citing Data
- MODIS Data Citations
- Challenges

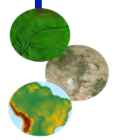


- ORNL DAAC archive for the NASA's Terrestrial Ecology Program
  - Biogeochemical dynamics

- Data Holdings (1,085 data sets)
  1. Field Campaigns
  2. Land Validation
  3. Regional and Global Data
  4. Model Archive

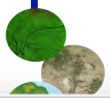
- Provide MODIS Land Product Subsets
  - Makhan Virdi's Poster

Motivation for Data Citations



- User Working Group in 1998 requested a metric for evaluating the impact of the ORNL DAAC on Science
- Use *data product citations* to indicate how many DAAC data sets have been used in peer-reviewed papers, dissertations, or policy reports
  - Data citation indices
  - Analogous to article citation indices

ORNL DAAC Data Citation Policy (est. 1998) DOIs add in 2007



DAAC Home > About Us > Data Citation Policy

Data Product Citation Policy

Citation Policy

To acknowledge the scientists who have provided products, we request that you include a bibliographic citation to all ORNL DAAC products that you use in your publications. Such citations will help others find the products and see how they have been used.

Citation information is provided in the documentation that accompanies all our data products. If you have questions about how to cite ORNL DAAC data products or services, please contact the ORNL DAAC User Services Office (USO).

An editorial "Citations to Published Data Sets" describes the rationale and advantages for data set citations.

The content of a Data Product Citation should include as much of the following information as appropriate:

- contributing investigators/authors
- year of publication
- product title
- medium (for items other than downloaded files; e.g., CD, DVD, tape, etc.)
- online location (i.e., URL)
- publisher
- publisher's location
- date accessed
- digital object identifier

Citation Style

- On-Line Data Set

  Turner, D.P., W.D. Ritts, and M. Gregory. 2006. BigFoot NPP Surfaces for North and South American Sites, 2002-2004. Data set. Available on-line [http://daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/750.

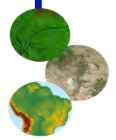
- Web Page

  Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC). 2009. SAFARI 2000 Web Page. Available online [http://daac.ornl.gov /S2K/safari.html] from ORNL DAAC, Oak Ridge, Tennessee, U.S.A. Accessed November 5, 2009.

- MODIS Subset

  Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC). 2009. MODIS subsetted land products, Collection 5. Available on-line [http://daac.ornl.gov/MODIS/modis.html] from ORNL DAAC, Oak Ridge, Tennessee, U.S.A. Accessed

Characteristics of an identifier (DOI)



- Persistent
  - Registered with The DOI System http://dx.doi.org/ through DataCite
- Actionable
  - http://dx.doi.org/10.3334/ORNLDAAC/1086
- Specific
  - Links to the data set
- Complete
  - Links to data and the information needed to understand and use the data
    - Data set landing page

Purpose of Data Citations

- Connect publications to their underlying data
- Facilitate data and science transparency and reproducibility
- Give scientists, data centers, and funders credit for producing and curating data sets
- Understand how data are used
- Track the products that derive from data

Slide courtesy of Matt Mayernik

DAAC-recommended Citation

Title:	**SAFARI 2000 MODIS L3 Albedo and Land Cover Data, Southern Africa, Dry Season 2000**
Project(s):	SAFARI 2000
Investigator(s):	MOODY, E.G. KING, M.D. PLATNICK, S.E. SCHAAF, C. GAO, F.
Data Set Documentation:	http://daac.ornl.gov//S2K/guides/S2K_MODIS_L3_albedo_guide.html
Access Restrictions:	PUBLIC
Data Set Location:	The Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC)
Data Center Contact:	ORNL DAAC User Services Office Oak Ridge National Laboratory Oak Ridge, Tennessee 37831 USA FAX: +1(865)574-4665 - ornldaac@ornl.gov Phone: +1(865)241-3952
Data Center URL:	http://daac.ornl.gov/
Data Set Citation:	Moody, E. G., M. D. King, S. Platnick, C. B. Schaaf, and F. Gao. 2006. SAFARI 2000 MODIS L3 Albedo and Land Cover Data, Southern Africa, Dry Season 2000. Data set. Available on-line [http://daac.ornl.gov/] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/840
Download Data Sets:	SAFARI 2000 MODIS L3 Albedo and Land Cover Data, Southern Africa, Dry Season 2000

Parameter Description:

Parameter	Sensor	Source	Term	Topic
LAND COVER	MODIS	TERRA	LAND USE/LAND COVER	LAND SURFACE
REFLECTANCE	MODIS	TERRA	SURFACE RADIATIVE PROPERTIES	LAND SURFACE

Citations to data sets indicate data reuse: Strack et al used five ORNL DAAC data sets

Fernández, A., 1998: An energy balance model of seasonal snow evolution. *Phys. Chem. Earth,* **23,** 661–666.

Hardy, J. P., and R. E. Davis, cited 1998: BOREAS HYD-03 snow water equivalent: 1996. [Available online at http://www.daac.ornl.gov.]

——, ——, R. Jordan, W. Ni, and C. E. Woodcock, 1998: Snow ablation modeling in a mature aspen stand of the boreal forest. *Hydrol. Processes,* **12,** 1763–1778.

Jin, J., X. Gao, S. Sorooshian, Z.-L. Yang, R. Bales, R. E. Dickinson, S.-F. Sun, and G.-X. Wu, 1999: One-dimensional snow water and energy balance model for vegetated surfaces. *Hydrol. Processes,* **13,** 2467–2482.

Jordan, R., 1991: A one-dimensional temperature model for a snow cover: Technical documentation for SNTHERM.89. Special Rep. 91-16, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, NH, 49 pp.

——, E. L Andreas, and A. P. Makshtas, 1999: Heat budget of snow-covered sea ice at North Pole 4. *J. Geophys. Res.,* **104,** 7785–7806.

Planetary Boundary Layer Parameterization, Shinfield Park, Reading, United Kingdom, ECMWF, 59–80.

Namias, J., 1985: Some empirical evidence for the influence of snow cover on temperature and precipitation. *Mon. Wea. Rev.,* **113,** 1542–1553.

Osborne, H., K. Young, V. Wittrock, and S. Shewchuck, cited 1998a: BOREAS/SRC AMS suite A surface meteorological and radiation data: 1995. [Available online at http://www.daac.ornl.gov.]

——, ——, ——, and ——, cited 1998b: BOREAS/SRC AMS suite B surface meteorological and radiation data: 1995. [Available online at http://www.daac.ornl.gov.]

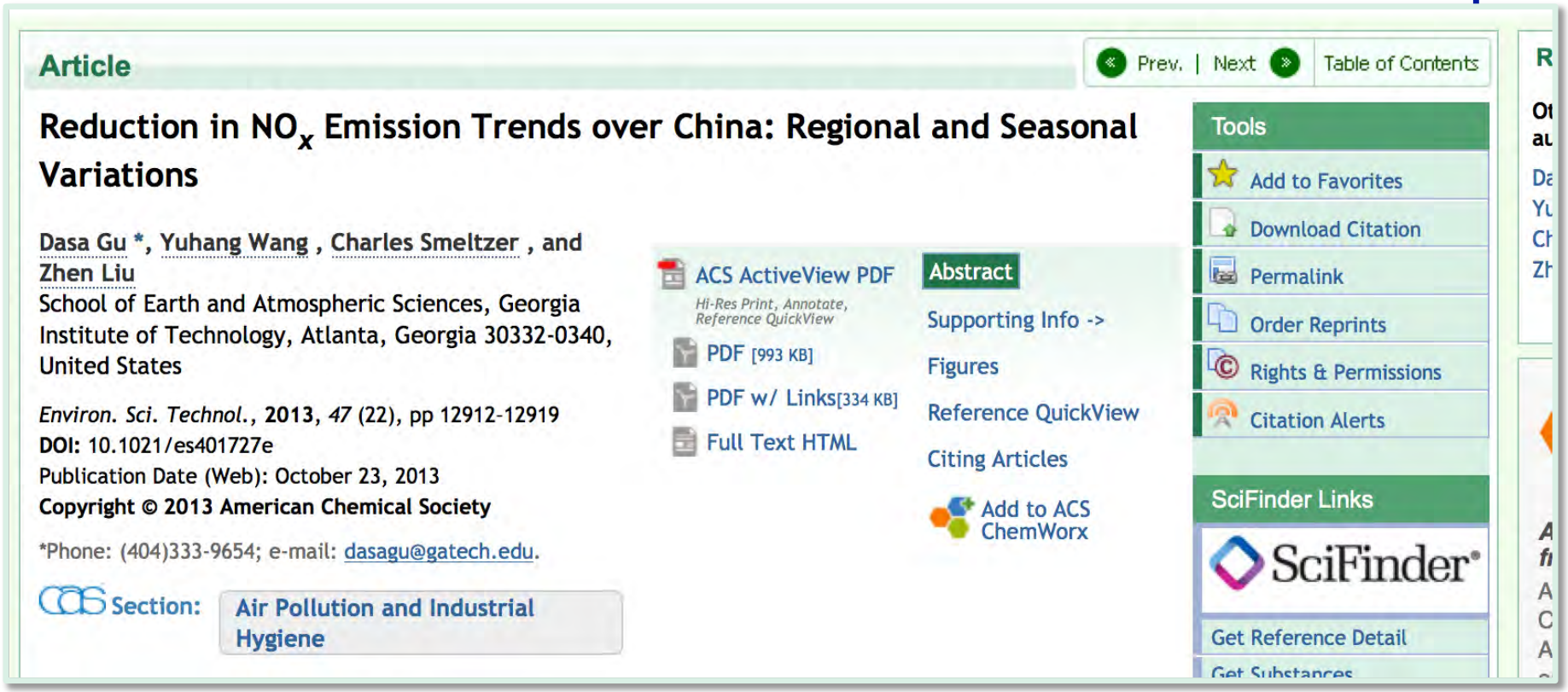
——, ——, ——, and ——, cited 1998c: BOREAS/SRC AMS suite A surface meteorological and radiation data: 1996. [Available online at http://www.daac.ornl.gov.]

——, ——, ——, and ——, 1998d: BOREAS/SRC AMS suite B surface meteorological and radiation data: 1996. [Available online at http://www.daac.ornl.gov.]

Pielke, R. A., 2002: *Mesoscale Meteorological Modeling*. 2d ed. Academic Press, 676 pp.

Strack, J.E., G.E. Liston, and R.A. Pielke. 2004. Modeling snow depth for improved simulation of snow-vegetation-atmosphere interactions. Hydrometeorology 5: 723 - 734.

Articles may "refer" to the data set



Article

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Reduction in NO_x Emission Trends over China: Regional and Seasonal Variations

Dasa Gu *, Yuhang Wang , Charles Smeltzer , and Zhen Liu
School of Earth and Atmospheric Sciences, Georgia Institute of Technology, Atlanta, Georgia 30332-0340, United States

Environ. Sci. Technol., **2013**, *47* (22), pp 12912-12919
DOI: 10.1021/es401727e
Publication Date (Web): October 23, 2013
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*Phone: (404)333-9654; e-mail: dasagu@gatech.edu.

Section: Air Pollution and Industrial Hygiene

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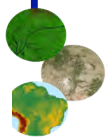
were assimilated using the WRF model constrained by the NCEP reanalysis product. The anthropogenic NO_x and VOCs emissions are obtained from the inventory by Zhang et al.(43) The biomass burning emissions are taken from the Global Fire Emissions Database, Version 2 (GFEDv2.1; available at http://daac.ornl.gov/). The lightning NO_x emission is parametrized as by Choi et al.(44)

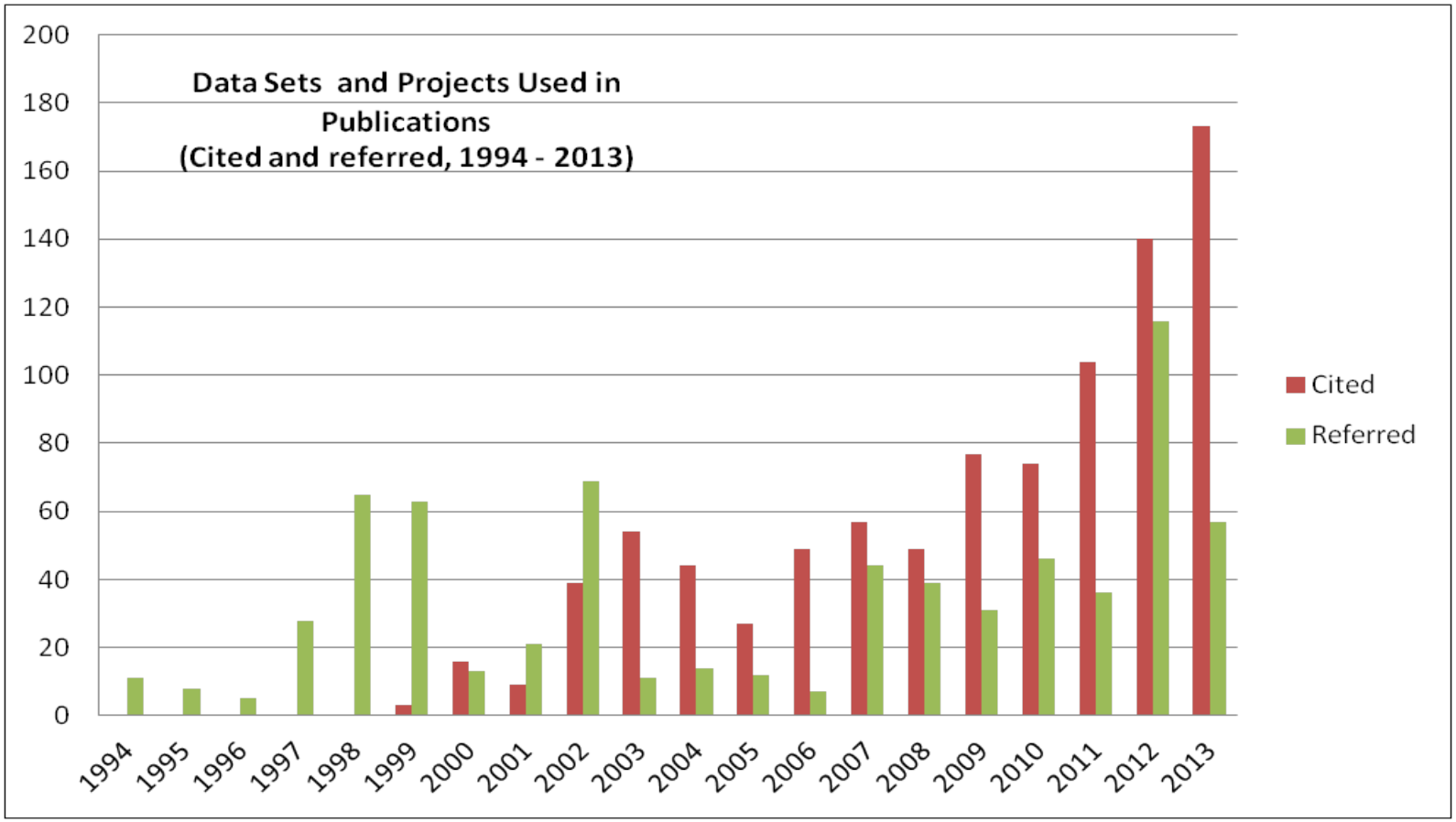
Estimating Scientific Impact: Steps Taken



- Review on-line services (e.g., Web of Science, Elsevier's Science Direct) to see if ORNL DAAC or DAAC Projects are mentioned or if data have been cited in papers
  - full text search, reference list

- Develop a database of articles (article DOI) and the data sets used in those articles

Use of ORNL DAAC Data in the Literature



Referred indicates a call out in the text

Show users:
how data used and where data cited

GLOBAL FIRE EMISSIONS DATABASE, VERSION 3.1

Download Data

Below are files for this data set. Click on a file link to display that file on your browser. The Companion Files are small but the Data Set Files can be quite

Year	Citation	DOI
2010	Bows, Alice., Barrett, John., Carbon Management, (2010). Cumulative emission scenarios using a consumption-based approach: a glimmer of hope?. 1 (1),161-175.	doi:10.4155/cmt.10.17
2010	Gerber, S., Hedin, L. O., Oppenheimer, M., Pacala, S. W., Shevliakova, E., Global Biogeochemical Cycles, (2010). Nitrogen cycling and feedbacks in a global dynamic land model. 24 ISBN: 0886-6236.	doi:10.1029/2008gb003336
2010	Hayes, DJ., McGuire, AD., Kicklighter, DW., Burnside, TJ., Melillo, JM., Eurasian Arctic Land Cover and Land Use in a Changing Climate, (2010). The Effects of Land Cover and Land Use Change on the Contemporary Carbon Balance of the Arctic and Boreal Terr	doi:10.1007/978-90-481-9118-5_6
2010	Zhao, Chun., Wang, Yuhang., Yang, Qing., Fu, Rong., Cunnold, Derek., Choi, Yunsoo., J. Geophys. Res., (2010). Impact of East Asian summer monsoon on the air quality over China: View from space. 115 (D9),D09301. ISBN: 0148-0227.	doi:10.1029/2009JD012745
2011	Huang, L., Fu, R., Jiang, J. H., Wright, J. S., Luo, M., Atmos. Chem. Phys. Discuss., (2011). Geographic and seasonal distributions of CO transport pathways and their roles in determining CO centers in the upper troposphere. 11 (12),32423-32453. ISBN: 16	doi:10.5194/acpd-11-32423-2011
2011	Schwalm, C. R., Williams, C. A., Schaefer, K., Baker, I., Collatz, G. J., R_denbeck, C., Biogeosciences, (2011). Does terrestrial drought explain global CO2 flux anomalies induced by El Ni_o?. 8 (9),2493-2506. ISBN: 1726-4189.	doi:10.5194/bg-8-2493-2011
2012	Auby, A. (2012). Modélisation à haute résolution du transport de polluants à longue distance. Sciences de l'Environnement, Université Pierre et Marie Curie-Paris VI, Paris.	(no doi)
2012	Gao, Y., Zhang, M.-G., Liu, X.-H., & Zhao, C. (2012). Model Analysis of the Anthropogenic Aerosol Effect on Clouds over East Asia. Atmospheric and Oceanic Science Letters (_____: ___), 5 (001), 1-7.	(no doi)
2012	ICP-Vegetation. (2012). Ozone Pollution: Impacts on carbon sequestration in Europe (No. None). Bangor, UK: Centre for Ecology & Hydrology, Environment Centre Wales.	(no doi)
2012	Randerson, J., Chen, Y., Werf, G., Rogers, B., & Morton, D. (2012). Global burned area and biomass burning emissions from small fires. Journal of Geophysical Research: Biogeosciences (2005_2012), 117 (G4).	doi:10.1029/2012JG002128
2012	Waldegren, L. T. (2012). Carbon Credits: Origins, Effectiveness & Future. Environmental and Energy Systems Studies, Lund University, Lund, Sweden.	(no doi)
2013	Al Razi K.M.H., Moritomi, Hiroshi. (2013) Numerical simulation for regional ozone concentrations: A case study by weather research and forecasting/chemistry (WRF/Chem) model. International Journal of Energy and Environment. 4(6): 933-954.	(no doi)
2013	Wu J., Guo, Jun, Zhao, Deming. (2013) Characteristics of aerosol transport and distribution in East Asia. Atmospheric Research. 132–133(0): 185-198.	doi:10.1016/j.atmosres.2013.05.018

Citation:

Randerson, J. T., G. R. van der Werf, L. Giglio, G. J. Collatz, and P. S. Kasibhatla. 2013. Global Fire Emissions Database, Version 3 (GFEDv3.1). Data set. Available on-line [http://daac.ornl.gov/] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. http://dx.doi.org/10.3334/ORNLDAAC/1191

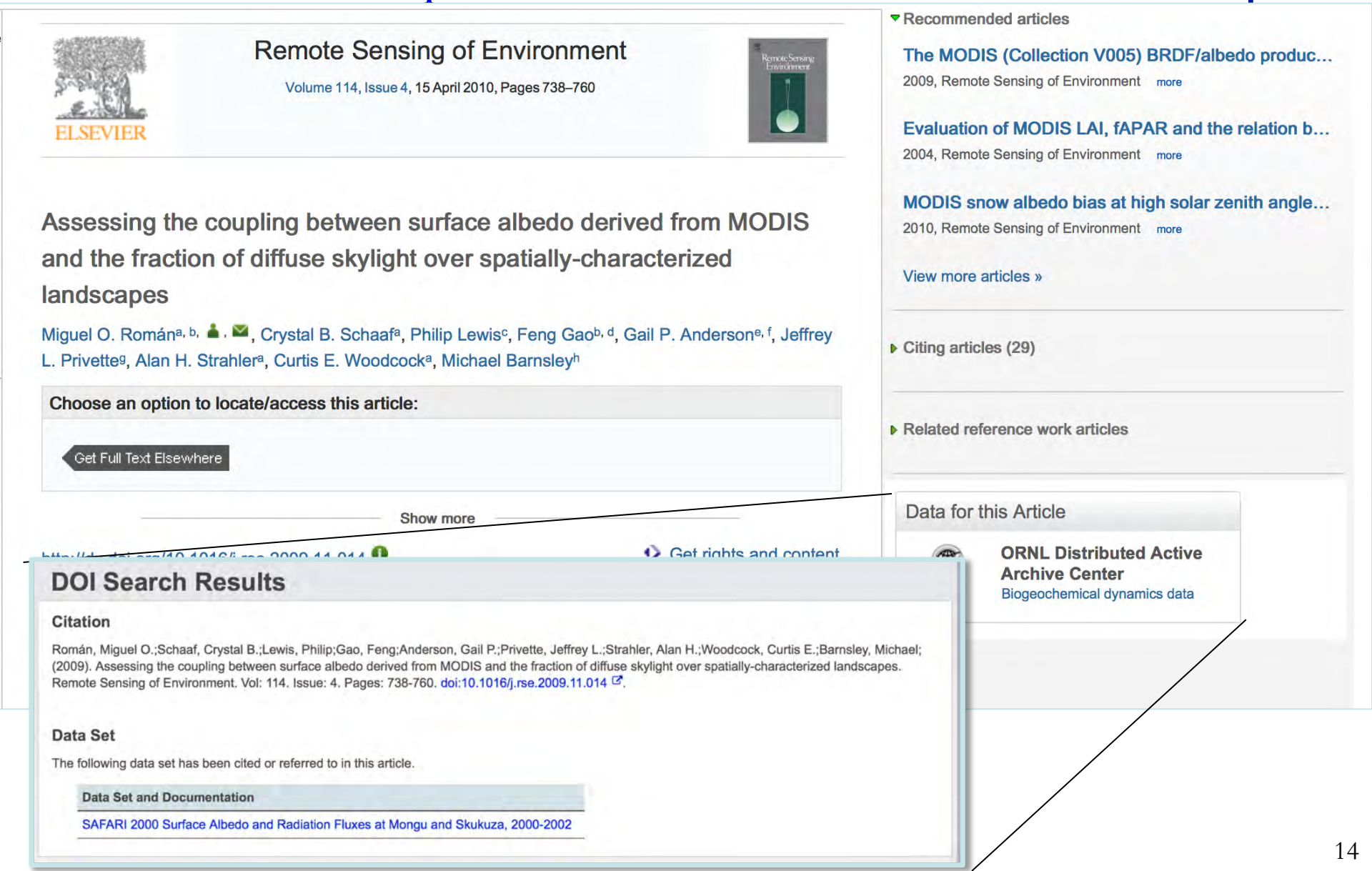
Publications Using This Data Set

Download Data Set Files: (1665.4 MBytes in 12 Files)
All Data Taken At Latitude: 89.50N, Longitude: 179.50E

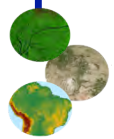
You may order only the files you are interested in by checking the 'Add to Cart' box and then the 'Add' button below. You may also click on the file link to see the file and to save it to your computer if you wish. You will need to display and save any companion files listed above. You may also order the complete data set by checking the 'Add Data Set' button.

Add to	Data Set File

Elsevier Linkage:
Web service queries ORNL Database

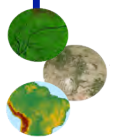


Presentation Outline



- Metrics of Impact
- Citing Data
- MODIS Data Citations
- Challenges

MODIS Data Citations



- In Collection 6, each MODIS product will have a registered DOI

MODIS Product	DOI
Net Photosynthesis	10.5067/MODIS/MOD17A2.006
Annual NPP	10.5067/MODIS/MOD17A3.006

- DOI embedded in each HDF-EOS tile
- **N.B. Citations have not been established**

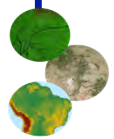
Possible example of citation: Based on NSIDC Citation Policy

DRAFT for general discussion

Hall, D. K., V. V. Salomonson, and G. A. Riggs. 2014. *MODIS/Terra Snow Cover 8-Day L3 Global 500m Grid.* Version 6. [indicate subset used]. Boulder, Colorado USA: National Snow and Ice Data Center. DOI: 10.5067/MODIS/MOD10A2.006

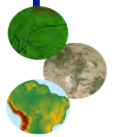
- MODIS Data Products
  - Need a policy for use of DOI and citation
  - Need to identify authors for citations

Presentation Outline



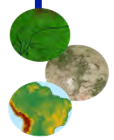
- Metrics of Impact
- Citing Data
- MODIS Data Citations
- Challenges

Challenges



- Ensuring consistent use of data citations
  - By authors, editors, and journals
- Tracking data usage, citations, and citation index
  - Publishing groups need to include data centers and data products in their compilations

Web Resources



- Data Citation Background
  https://www.force11.org/datacitation
  http://wiki.esipfed.org/index.php/Interagency_Data_Stewardship/Citations

- ORNL DAAC Search by article DOI
  http://daac.ornl.gov/doi_search_page.shtml

- Data Citation Policies
  http://nsidc.org/about/use_copyright.html
  http://daac.ornl.gov/citation_policy.html
  https://lpdaac.usgs.gov/about/citing_lp_daac_and_data
  http://podaac.jpl.nasa.gov/CitingPODAAC